Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Walnut Creek

Waterbody Segment at a Glance:

County: Cedar
Nearby Cities: El Dorado Springs
Length of impairment: 1.0 mile
Pollutant: Biochemical Oxygen Demand (BOD) and Volatile Suspended Solids (VSS)
Source: El Dorado Springs Wastewater Treatment Plant (WWTP)


State map showing location of watershed

TMDL Priority Ranking: Approved 2006

Description of the Problem

Beneficial uses of Walnut Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to BOD) in streams is 5.0 mg/L (milligrams per liter or parts per million).
- Standards for Volatile Suspended Solids may be found in the general criteria section of the WQS, 10 CSR 20-7.031(3)(A) and (C) where it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

Any water body that was listed for Non-Filterable Residue (NFR) in 1998 is now being listed as Volatile Suspended Solids (VSS). This change was made to better distinguish between organic solids coming from wastewater treatment plants (VSS) and mineral solids (soil or mineral particles) coming from soil erosion or erosion of mine waste materials or stockpiles (Non-Volatile Suspended Solids or NVSS).

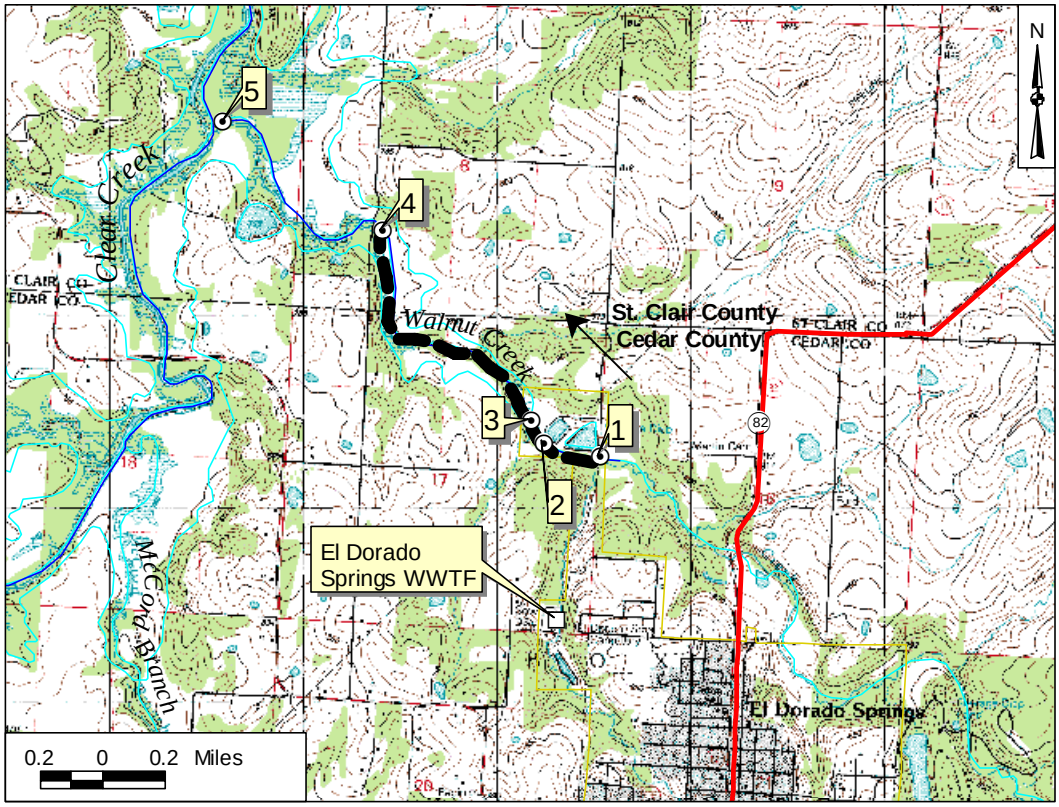
Walnut Creek shows low levels of dissolved oxygen downstream from the El Dorado Springs Wastewater Treatment Plant (WWTP). Wastewater high in Biochemical Oxygen Demand (BOD) reduces dissolved oxygen in the stream's water. Most aquatic organisms require high levels of oxygen to survive. There is also an accumulation of objectionable solids in the same stretch of the creek. VSS refer to particles that are suspended in water, like algae, or those that settle out, like the sewage sludge in Walnut Creek. When these solids settle onto the streambed, they smother natural substrates (stream bottom), aquatic invertebrate animals (like crayfish and water insects) and fish eggs.

The 1998 listing for the impaired reach was based on stream surveys of Walnut Creek conducted by the department in 1983, 1985, 1988 and 1994. These surveys cited sludge, green water, bacterial slime, minor odor, blackfly and midge larvae (abundant), and caddisfly larvae (sparse). The water upstream of the WWTP was described as clear, the substrate had a good appearance and minnows, sunfish and caddisfly larvae were noted.

Like all wastewater discharges in Missouri, the El Dorado Springs WWTP has to meet the requirements of a discharge permit issued by the department. This facility received new permit limits when their permit was renewed in March 2006. These limits will go into effect in three years, giving time for the city to upgrade the WWTP, which should enable Walnut Creek to meet WQS. The U.S. Environmental Protection Agency accepted the permit in lieu of a TMDL on May 26, 2006.

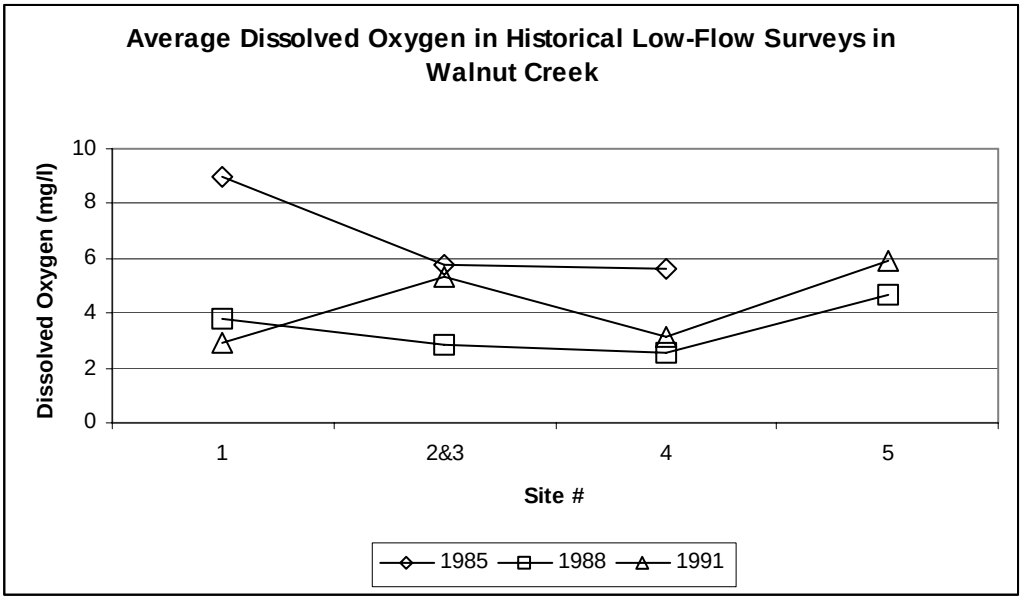
Dissolved oxygen data and the site index for the map below are on the next page.

Impaired Portion of Walnut Creek in Cedar County, Missouri



Impaired Segment ← Direction of Flow

Site Index
1 – Walnut Creek just above Eldorado Springs WWTP
2 – El Dorado Springs WWTP effluent
3 – Walnut Creek 0.1 mile below El Dorado Springs WWTP
4 – Walnut Creek 1 mile below El Dorado Springs WWTP
5 – Walnut Creek near mouth



Source: Missouri Department of Natural Resources

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